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Initiation of Polymerization by Tetrabutylammonium *p*-Lithiophenoxide

The new compound, tetrabutylammonium *p*-lithiophenoxide, has been found to be an efficient polymerization initiator that is also capable of producing a polymer with a phenol group at the initiating end of the chain. Analogous initiators, such as lithium *p*-lithiophenoxide, can produce the same phenol-terminated polymer; however, such compounds are insoluble in solvents like tetrahydrofuran (<0.4 g/liter) because of the presence of the inorganic atom in their structures. The limited solubility precludes use of the inorganic metal salts for large-scale polymerizations.

The rationale behind the preparation of the new compound was predicated on the assumption that replacement of the inorganic atom with the organic tetrabutylammonium group would provide a much more soluble initiator, and this was indeed shown to be true. The tetrabutylammonium derivative has been found to be much more soluble than the lithium derivative (>8.0 g/liter). Consequently, the tetrabutylammonium derivative may be freely used as a polymerization initiator to produce large quantities of phenol-terminated polymers.

The new compound is prepared by forming tetrabutylammonium *p*-bromophenoxide from *p*-bromo-

phenol and tetrabutylammonium hydroxide and then treating the tetraalkyl-substituted phenoxide with *n*-butyl lithium in tetrahydrofuran.

Reference:

Hirshfield, S. M.: Polymer Containing Functional End Groups is Base for New Polymers. NASA Tech Brief 71-10184, June 1971.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
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Reference: B72-10223

Patent status:

No patent action is contemplated by NASA.

Source: Stanley M. Hirshfield of
Rocketdyne/North American Rockwell Corp.
under contract to
Ames Research Center
(ARC-10553)

Category 04